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**Listing of Claims:**

Claim 1-41. (Canceled)

Claim 42. (Presently Amended) A system for preventing or reducing the severity of renal damage due to a blood-borne substance that is toxic to the kidneys of a human or veterinary patient, said system comprising:

a heat exchange catheter insertable into a blood vessel of the patient;

a temperature controller in communication with the heat exchange catheter to cause the heat exchange catheter to reduce the temperature of at least the a patient's kidneys to a temperature at which the substance-induced renal damage is prevented or mitigated; and

an antishivering agent element.

Claim 43. (Original) The system of claim 42, wherein the heat exchange catheter comprises at least one balloon containing a heat exchange fluid flowing from the temperature controller.

Claim 44. (Previously Presented) The system of claim 43, wherein the at least one balloon is circumferentially disposed about the catheter to direct the heat exchange fluid in an opposite direction of blood flowing past the catheter.

Claim 45. (Original) The system of claim 42, wherein the temperature controller includes

temperature monitoring means for monitoring the patient's temperature; and

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temperature adjusting means for adjusting the temperature of the heat exchange catheter to maintain a constant reduced temperature of the patient's kidneys.

Claim 46. (Original) The system of claim 45, wherein the temperature adjusting means adjusts the temperature in response to the temperature monitored by the temperature monitoring means.

Claim 47. (Original) The system of claim 42, wherein the heat exchange catheter comprises a flow disruption device to disrupt the laminarity of blood flow around the catheter.

Claim 48. (Original) The system of claim 42, wherein the temperature controller controls the temperature and flow of heat exchange fluid flowing through the heat exchange catheter.

Claim 49. (Previously Canceled)

Claim 50. (Cancelled)

Claim 51. (Previously Canceled)

Claim 52. (Previously Presented) The system of claim 42 wherein the anti-shivering agent is selected from the group consisting of: dopamine receptor blockers; dopamine receptor agonists; kappa opioid receptor agonists; opioid agonist-antagonist analgesics; serotonin 5HT1a receptor agonists; and their pharmaceutically acceptable salts.

Claim 53. (Previously Presented) A method for preventing or reducing the severity of kidney damage in a human or veterinary patient to whom a potentially nephrotoxic substance is to be administered, said method comprising the steps of:

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providing a heat exchange catheter that has a heat exchanger which is positionable within a blood vessel of the patient and a controller that controls the temperature of the heat exchanger;

positioning the heat exchanger in the inferior or superior vena cava of the patient without entirely preventing the flow of blood around the heat exchanger; and

controlling the temperature of the heat exchanger to reduce the temperature of the patient's blood and to cool the patient's kidneys, thereby preventing or reducing the severity of kidney damage resulting from the substance; and

administering the substance to the patient.

Claim 54. (Previously Presented) The method of claim 53, wherein the patient's kidneys are cooled prior to the administration of the substance to the patient.

Claim 55. (Previously Presented) The method of claim 53, wherein the patient's kidneys are cooled during the administration of the substance to the patient.

Claim 56. (Previously Presented) The method of claim 53, wherein the patient's kidneys are cooled after the administration of the substance to the patient.

Claim 57. (Previously Presented) The method of claim 53, further comprising the step of maintaining the reduction in temperature during the administration of the substance to the patient.

Claim 58. (Previously Presented) The method of claim 53, further comprising a step of disrupting the laminar flow of blood around the heat exchange catheter.

Claim 59. (Previously Presented) The method of claim 58, wherein the laminar flow of blood is disrupted by one or more fins provided on the heat exchange catheter.

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Claim 60. (Previously Presented) The method of claim 53, wherein the heat exchange catheter is positioned in the patient's venous vasculature.

Claim 61. (Previously Presented) The method of claim 53 wherein the substance causes ischemic injury to the kidney and wherein the patient's kidneys are cooled to a temperature that reduces ischemic injury.

Claim 62. (Previously Presented) The method of claim 53 wherein the patient's temperature is reduced to a temperature between 32 degrees Celsius and 37 degrees Celsius.

Claim 63. (Previously Presented) The method of claim 53, further comprising a step of administering an anti-shivering treatment to the patient.

Claim 64. (Previously Presented) The method of claim 63, wherein the anti-shivering treatment is an anti-shivering agent selected from the group consisting of: dopamine receptor blockers; dopamine receptor agonists; kappa opioid receptor agonists; opioid agonist-antagonist analgesics; serotonin 5HT1a receptor agonists; and their pharmaceutically acceptable salts.

Claim 65. (Previously Presented) The method of claim 53, further comprising a step of monitoring the temperature of the patient.

Claim 66. (Previously Presented) The method of claim 53, further comprising steps of:

monitoring the temperature of the patient; and

adjusting the temperature of the heat exchange catheter based on the temperature so monitored.

Claim 67. (Previously Presented) The method of claim 53 wherein the substance comprises a radiographic contrast medium.

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Claim 68. (Previously Presented) The method of claim 67 wherein the step of administering the substance to the patient comprises injecting the radiographic contrast medium into the vasculature of the patient.

Claim 69. (Previously Presented) The method of claim 53 further comprising the step of:

diagnosing in the patient a pre-existing renal disorder or other condition that renders the patient at greater than normal risk for suffering clinically significant renal damage due to administration of the substance.